SUMMER OF ACTIVITY

To most Canadians summer brings, along with its hot weather, such pleasant forms of relaxation as vacations, sports and picnics. The individual employee in the oil industry may also enjoy these things but to the industry as a whole this summer brings the prospect of unceasing effort as it sweats its way through the largest and most urgent tasks it has yet undertaken.

The biggest—and most urgent—job is the Interprovincial pipe line which will stretch 1,800 miles from the Edmonton oil fields to Lake Superior. To pick up crude at the end of the main pipe line, two ships will be the largest fresh-water tankers in the world are under construction at Port Arthur and Collingwood shipyards. These great ships will move the crude oil which the pipe line delivers at Superior, Wis., to refineries in Ontario.

In the oil fields development work will continue as potential production moves toward the 150,000 barrel per day mark in Alberta. In the Leduc field there is an additional task—ironing out operational problems in the new gas conservation plant which will make useful products from the field’s natural gas.

This summer four prairie refineries are under construction and the capacity of existing plants is being increased. To connect the Interprovincial pipe line with refineries in the Winnipeg area a 75-mile line is under construction.

The oil search has spread eastward into Saskatchewan and Manitoba, westward into British Columbia and northward in Alberta, where wildcat wells have struck oil at Normandville and at Whitelaw.

The projects listed here are by no means all of the matters engaging the oil industry’s attention in the summer of 1950. It has been estimated that oil companies have budgeted for expenditures in the neighborhood of $300 million this year.

The completed tasks—pipe lines, refineries or tankers—will add such benefits as useful plants and larger pay rolls to the nation’s industry; and they are urgent tasks because their completion will mean that Canada’s great need for oil will be filled in larger measure by domestic production. That is why sweating men are driving hard through these summer months.

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ON THE FRONT COVER: The young stamp collector on our front cover has obtained a copy of the new Canadian “Oil Stamp.” See the story on page 15

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Manitoba’s ‘Cat’

Work is underway on Imperial Oil’s new refinery near Winnipeg which will cost an estimated $10 million to complete. Earth moving equipment is busy on a 400-acre property on the east bank of the Red River north of the downtown city area. By May, 1951, the new construction-scarred, raw earth will be the site for the buildings, the towers and tanks of a modern oil refinery.

Capacity of this new refinery will be 10,000 barrels—350,000 gallons—a day. It will be supplied with raw material from the crude oil pipe line which Interprovincial Pipe Line Co. is building from Edmonton to the Great Lakes. It will transform this oil into high octane gasoline, diesel fuel and kerosene, and heating oils.

The decision to build the refinery was based on two facts. First, Winnipeg and the areas that it can supply represent a large and growing market. Second, when the pipe line to the Lakes is completed it will be possible for the first time to deliver crude oil at low cost to Winnipeg. And with lower cost crude, large-scale refining becomes economically possible.

On May 30 Imperial Oil announced that the refinery would be supplied by a pipe line from Great to Winnipeg. The line, costing some $25 million will move oil from the Interprovincial pipe line now being built from Edmonton to Lake Superior.

The 75-mile line will be 10 inches in diameter and initial throughput will be about 14,000 barrels a day, although the line will be capable of handling up to 30,000 barrels daily.

Although there has been some refining activity in Manitoba, up to now about two-thirds of the province’s oil needs have been supplied from the east. Finished products have been brought by tanker across the Great Lakes and transported to the prairie by railway tank car. In some cases, products have been brought by rail from as far away as Montreal.

Construction of the refinery will change this flow. With Alberta crude available products will be manufactured “on the spot” and they will be distributed through Manitoba and parts of northwestern Ontario.

(Continued on page 6)
FACTS ABOUT THE NEW REFINERY

Capacity will be 10,000 barrels (350,000 gallons) a day using crude piped from the new Alberta fields.

On this illustration (1) is the distillation unit where the crude will be broken into the raw primary products such as gasoline, kerosene, heating oils, etc. This still also will supply feed oil for (2) the fluid catalytic cracking unit and gas recovery unit which will process high-quality gasoline. This “cat cracker” will be the first in western Canada. (3) is the central treating plant where raw products from (1) and (2) will undergo further refinement. (4) is the tank farm providing storage for finished products in tanks holding as much as 1,900,000 gallons each. (5) is the water pump house and steam generator.

Also shown are an ethyl plant, testing laboratory, central control room, mechanical shops and store-house, lunch and locker buildings.

Scene of Tomorrow

This is an artist’s conception of the Winnipeg refinery site when construction has been completed.
In announcing that the refinery would be built, Imperial said, "Increased refinery capacity together with movement of Alberta crude eastward by pipe line will mean lower petroleum product prices in the area served by the new facilities." Of the effect on Manitoba's industries, the Winnipeg Tribune had this to say:

"From an engineering point of view an adequate supply of bunker oil in this vicinity provides an economic alternative to going farther afield for additional sources of hydro-electric power. This is only one of the ways in which the refinery will modify the basic economic and industrial picture for Greater Winnipeg and Manitoba. Petroleum is one of the contributions of industrial development. Its effects will be felt throughout the whole economy. Many types of industrial production are made feasible, and the opening of the refinery may well mark the opening of a new stage in the industrial expansion of this province."

Winnipeg refinery will be built in about a year. The engineering work will be carried out by Imperial's Engineering and Development department at St. Albert, by Universal Oil Products Co., and by the Canadian Kellogg Co. Ltd. Construction will be by Canadian Kellogg Co. Ltd. and local contractors in Winnipeg.

The work at the site began in April, when engineers tested the soil to determine whether it would hold the refinery units or whether piling would have to be driven. Then when the weather improved, the bulldozers and earth movers appeared on the 400-acre site to prepare it for the construction work.

The refinery will consist of two main units together with service units, facilities for employees, and other buildings. The first of the main units is the regular distillation plant which takes in crude oil and turns out raw gasoline, kerosene, tractor, diesel and stove and furnace fuels. This unit also provides the oil "feed stock" which goes on to the second big unit, the fluid catalytic cracking unit.

Gases produced by the distillation and cracking processes will be separated in a gas recovery plant and some of them blended with the gasoline to give quick starting properties. The raw light products turned out in the distillation and cracking units will be further purified in a central treating plant before they are ready for the consumer.

The fluid catalytic cracking unit, which is of a new type, turns the feed stock into gasoline which has a considerably higher octane rating than gasoline which comes from the still. Both main units also turn out heavy products like bunker fuels, asphalts, and a combination of the two units is typical of the most modern refineries in the world. A refinery of this sort also has to have a steam plant, testing laboratory, water pumping station, small plant for adding tetra-ethyl lead to gasoline, loading racks, an electrical sub-station, an office building, and tanks to hold crude oil and refined products.

The property on the Red River is near the area where the pioneer Lord Selkirk settled the Haldimand community. At one time the refinery site was owned by the grandfather of one of the men concerned in the discovery of the Leduc oil field. R. R. Taylor bought the land in 1898 and, until 1901, he and his son, Sam Taylor, farmed there. The grand- son, Vern Taylor, was operations manager of Imperial's western producing department in 1947 when the Leduc discovery well came in and he is now operations advisor to the producing department in Toronto.

When in full operation the refinery will employ about 175 persons. Most of them will be drawn from the Winnipeg area and trained specially for their new jobs. Key men, however, will come from other Imperial refineries because processing oil is a job that demands men with long years of specialized experience.

Keith Lewis, a native of Belmont, N.S., has been appointed superintendent of the new refinery. He joined Imperial in 1933 at Halifax refinery. In 1942 he served with St. Clair Processing Corp., as one of the specialists needed for Canadian wartime production of synthetic rubber, and later became assistant manager. He held various positions in the manufacturing department before his appointment in 1948 as superintendent of Imperial's Montreal East Refinery. The new pipe line which will bring crude to the refinery will require one pumping station, which will be built at Gretna, adjacent to the Interprovincial Pipe Line Company's station there. Pipe has been ordered in Britain and is now being brought to Montreal for rail shipment to Manitoba. The contract for construction of the line has been awarded to Sprang-Fowler Co. Ltd., of Edmonton.

In addition to the 75-mile main line, the system will have a 31/2-mile take off, eight inches in diameter, which will supply another Winnipeg refinery. The system will be owned by the Winnipeg Pipe Line Co. Ltd., a newly organized subsidiary of Imperial Oil.

Imperial has from the start of its planning provided for future expansion of the refinery at the site on the site have been set aside for the installation of additional units when future oil demands warrant their construction. The refinery will be ready to play its part in the progressive development of the province — which will continue in spite of the effects of the recent flood.
Industry in Manitoba

This new refinery will supply an area in which diversified industries are developing. Manitoba is primarily an agricultural province but the industrial production has grown from a total value of $324.3 million in 1928 to $483 million last year.

In addition to the meat-packing and flour and feed industries, Manitoba has a substantial production of railway rolling stock, factory clothing and other products less closely associated with agriculture. The natural resources of forests, minerals, and large lakes have developed pulp wood production, mining, fishing, and trapping.

Imperial pioneered in supplying oil products in the area. The company appointed a Manitoba representative in 1931 and Winnipeg’s population was about 80,000 when the first bulk station was established. Large quantities of products have been provided for the growth of the west.

Alberta’s oil has made the Winnipeg refinery possible but some day oil may be found in Manitoba. Exploration is being conducted by several companies and this year Imperial has joined the search.

Agriculture remains Manitoba’s top industry. The province claims to have the most stable agricultural conditions in western Canada. Mixed farming is increasing and machines, such as this tractor at Beausejour, are used by many farmers.

Manitoba’s industrial production totaled $483,000,000 last year and 67 new industries were started. Shown here is the Manitoba legislative building which is a provincial symbol. It is built of the famous Tyndall stone from prehistoric quarries.

Free railways make Winnipeg a great distributing centre. The CPR yards are the largest privately-owned yards in the world.

The slaughtering and meat-packing industry has the highest gross value of production among Manitoba industries apart from agriculture. This modern packing plant is at St. Boniface.

These red hot bars are on display at an auction in Winnipeg. Manitoba’s fur trade is historic but now ranks after other industries including foods, factory clothing and printing.
Oil and the Flood

An unsung hero of the Manitoba flood was the bulldozer. Here's the story of the people who kept the diesels in operation.

The first Friday of May, 1950, is a flood-surrounded date that the people of southern Manitoba and of Winnipeg will remember vividly for many years. When one man thinks of that Friday, he will recall Norwood's Lyndale dike where one of his rubber boots became so deeply embedded in the green clay of the Red River valley that four men could not pull it free. The boot had to be dug out with a spade.

Another will remember that he sank into the clay to his hips and the other dike-workers could not get him out. Finally a bulldozer backed perilously close to him. He grabbed the bulldozer and was yanked free only by its great power as it inched away from him.

A woman has memories of a scene that seemed to be from some strange world. She was running home for coffee for the dike-workers when she saw a dozen of her neighbors on a street corner with their backs bent into the 50-mile gale, holding wet bags to be filled with wet sand while the wind drove sleet in a howling line parallel to the pavement.

The men and women of Emerson and St. Jean Baptiste and Morris, where the flood had hit earlier, will remember that night as the last crumbing blow in their two weeks of flood-fighting—the night that doomed some of their homes and businesses forever. And farmers in the flood areas will remember it because they finally knew in their hearts that they had little or no hope for seeding or normal farming this year.

(Continued on page 12)

Left—An army "duck" plows the water-covered streets of Emerson, one of the first towns flooded. Right—Many of the flood evacuees saved few belongings when they were forced from their homes.

With no respect for persons or property, the Manitoba flood engulfed schools, churches, hospitals, homes and businesses. Here a member of a naming crew is photographed as she looks with sadness across the swollen, debris-filled Red river.

Like this exhausted dike worker, many Imperial Oil employees in Manitoba finished a full day's work keeping oil empire flowing, then knelt for hours on the dike at night. This they did throughout the 10-day battle and when they could get in during the relentless battle to keep the river from flooding their homes and all of Winnipeg.

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On that May 5th the people in the path of the flood could not help thinking of themselves and their possessions but a great many felt that more than their own homes and families and gardens were at stake. They were joined in a great mass effort of individuals, organizations, and industries that tackled the tremendous job of smashing the Red River back into place.

The oil industry was one of those concerned. Gasoline and oil were needed for the cars and trucks that carried food and volunteers to the danger points in the dikes; diesel fuel for the bulldozers and tractors; aviation fuel for aircraft that brought in flood-fighting supplies and carried out the first of what was to become an evacuation of more than 100,000 women and children and aged from the stricken areas.

That Friday night Imperial’s Manitoba division threw into high gear an emergency supply program that eventually reached across Canada and into the United States. In all the turmoil of the flood weeks there was no shortage of gasoline and oil.

As early as April 22, when the waters first swept down the main street of Emerson, on the Canadian border, Imperial’s Manitoba division had begun to feel the flood. That was when the Imperial dealer in Emerson found he was supplying gasoline for boats rather than for cars and trucks.

As the river crept over farms and highways, railroad lines and other towns north of Emerson, Imperial dealers one after another were flooded out until 22 outlets representing a normal annual volume of almost half a million gallons of products were forced to suspend business.

In Greater Winnipeg the first warnings came to the division about the end of April when the Brandon brothers of St. Boniface asked Imperial to keep supplies rolling for the equipment that was building up the great Lyndale dike in Norwood. This project continued work that had started during the 1948 floods and was soon followed by other large dikes on which all the Greater Winnipeg contractor worked at fever pitch, eventually bringing in every available piece of equipment from within a radius of 100 to 200 miles.

All was this to preliminary that first Friday night in May, in mire and slush and mud, when the Red broke through dikes in suburban Fort Garry and Wildwood and Elm Park and it appeared that St. Vital and the Winnipeg district of Riverview would go, too.

There was a rush for transportation of people and effects. Volunteer cars and trucks were offered in hundreds. By an arrangement with the Volunteer Aid Bureau, supervising evacuation, the company-owned service station at Port and Graham in downtown Winnipeg provided "no charge" gasoline for cars engaged in transporting workers to the dikes. The Bureau simply telephoned the name and our licence number of the man who was coming in for gasoline and it was supplied.

When the Wildwood dikes broke, the Imperial dealer supplied gasoline and oil to keep the cars rolling and waded no time on bills for payment. The dealer’s own home was among the flooded, his furniture floating as water swept in on the first floor. Eventually his station housed 10 outboard motors belonging to former non-driving customers. A secondary dike fenced the station and was in turn fringed by boats of residents who came occasionally to look sadly at their flooded homes and try to save some prized possessions.

The fight to save the remaining dikes went on in cold and rain and snow. On Sunday, May 7, Imperial formally offered its full facilities to the Manitoba premier and the new Army commander of flood-fighting, Brigadier R. E. Morton.

The offer was accepted immediately but by Monday morning the Company found that of a normal staff of 199 employees 60 were away trying to save their own homes. That left a staff cut by one-third for operations that required a 24-hour day.

In the division office on Winnipeg’s Main St., not far from the flood-engulfed Norwood bridge, telephones were flooded out, but a new emergency line—a line only—was put in. No long distance calls could be made in out of Winnipeg but the Company telephones kept communications open.

J. E. Allett, the division manager, listed the personnel available for work; learned that only one corner of Imperial’s new refinery site a few miles north of Winnipeg was covered with water but that the construction equipment could be used elsewhere to fight the flood; heard that a Company plane was on route from Toronto with a load of waders and rubber boots; and put in action the long-range plans that kept Imperial’s supplies at a level to meet any emergency even total evacuation of the city.

The bulk plant is relatively distant from Winnipeg’s two rivers but emergency equipment had to be provided there. A water pump for pumping was set up and another emergency unit for lighting was brought in from Edmonton. Both could be used if Winnipeg’s power stations were flooded out and they could be in operation in 30 minutes if the power was cut off.

Anticipating an abnormal demand for aviation fuel, the Company had large stocks on hand. Another 57 tank cars of surplus were ordered from Montreal, Fort William and Calgary. Supplies in Edmonton and Vancouver were surveyed and held ready.

To backstop this effort, a tank carrying 8,800 barrels of aviation fuel began moving toward Fort Williams from the east, and another tankage cargo of 4,000 barrels was purchased in the United States and started on its way to the Lakeshore.

Hand-pumping kits were flown in from outside points so that if power-pumping units in Imperial service stations were flooded the supply would not dry down and not be cut off.

The Company told its employees to place the preservation of their families and homes first. Like many Winnipegners, a large number of employees from the plant and the division office carried on their duties for the Company during the day; worked on the dikes at night; and returned to the problems of

During the flood this sandbagged Imperial service station at Wildwood switched from cars and cars to outboard motor boats. Here a boat owner uses a hydrant as a mooring post for his craft.

Three Winnipeg hospitals (right, center) were flooded out in the Riverview district. In background is the downtown diners.
the oil supply in the morning, red-eyed and tired. Many had homes in endangered areas and they worked with the threat of a break in the dike hanging over their heads.

At first the resident manager, Ernie Nesbitt, was in charge of a section of the mile-long dike protecting the Leighton Ave., district of East Kildonan where his own home was. (The dike broke later.) He was needed at the plant and returned to find some men had been working up to 18 and 20 hours a day.

To meet the manpower shortage he requested the assistance of many men whose normal job had been wiped out by the flood—clerks, salesmen and others.

Experienced plant men were flown in from Saskatchewan by an Interprovincial Pipe Line Co. plane to replace employees who were fighting to save their homes and those called up by the reserve forces. The planes carried out refugees on its return trips. To be available at all times, the Saskatchewan men were quartered in the plant where, for a while, three refugee families were housed. There was water in the plant basement but extra pumps were flown in from the east to control it.

A major job at the plant was to keep supplies flowing to the St. Boniface-Norwood sector where three Imperial men supervised the 24-hours a day operations of a depot at Norwood school. They had the help of up to 30 civilians volunteers a day.

Crossing flood-bound bridges with supplies for Norwood meant that equipment often rolled through water that was within inches of the driver’s seat. Deliveries had to be made through flooded streets and subways.

The Nordele depot dispersed thousands of gallons of oil products every day during the height of the flood. At the beginning there was no tank and products had to be delivered in barrels instead of by tank truck. A wooden ramp was built in the school yard so that drivers of cars and trucks, who were travelling constantly through deep water, could change their own oil.

A volunteer truck carried diesel fuel to the dike for the heavy earth-moving machines. Mechanics refueled and serviced the machines while the operators took a few minutes to eat hot meals provided by the women of the district.

In addition to the large gasoline and oil depot at the Nordele school, other fueling points were established on street corners in vital dike-front sectors all over the city.

At Steenwold Field, the main airport, consumption of aviation fuel had quickly tripled normal volume because of the heavy traffic. Imperial served planes of Trans-Canada Airlines, Canadian Pacific Airlines, and those of smaller lines and private craft all of which arrived in large numbers on flood missions.

Gordon Bracken, who directs his work for Manitoba division, had extra help from Alberta—experienced airport attendants who were quartered at the airfield to be on hand for any emergency. Bracken had evacuated his family from his Elm Park home where seven feet of water swirled around on the main floor.

A refueling tender was driven from Saskatchewan to Steenwold Field. By using a pump from one of the smaller of the five refueling tenders, pumping capacity was increased from storage tanks to about 100 gallons a minute from the normal of 45 gallons. This meant gasoline could be pumped from storage as fast as it could be loaded into aircraft.

As the flood waters rose higher and higher, Manitoba division planned that if total evacuation of the city was ordered, key office personnel with some accounting machines would be moved to Regina to set up a temporary Manitoba division accounting office there.

Under such conditions, of course, plant personnel would have been left in, or near, Winnipeg to man their supplies for the evacuation. A reserve stock of 35,000 gallons of gasoline and oil was set up at the height of the flood. Unfortunately, as gasoline was the first to be cleared from the flooded areas, only the last 10,000 gallons were used in the process and the rest was wasted.

During all the crisis, normal supplies were sent to those of Manitoba division’s 940 dealers and 240 agents who are in areas not affected by the flood. Where seedling operations could begin, oil and gasoline were available as usual.

Special services were provided for homes with domestic oil burners where there was any danger of flooded basements. Some of the motors were removed temporarily and tanks were filled to capacity because a full tank had better chances of holding down and not becoming disabled in the flood.

There were many human highlights to the effort. Imperial’s women office workers spent their noon breaks and hours making sandwiches for dike workers and for employees on night shifts. One driver in the fuel oil division arrived at a home that was flooding faster than a tank in that it wouldn’t break loose in the basement; he remained to help a woman move a small piano upstairs to safety.

Some Imperial employees were called into the reserve armed services. Lt. Col. Bar Miller, manager of industrial sales, directed evacuation of St. Boniface hospital and worked in charge of pumping equipment on a vital section of the St. Boniface dike. A city salesman operated a gravel loader, supplying sand for the thousands of volunteer baggers.

The homes of 11 Company employees were flooded out and 18 families were evacuated from the city. Many other families had to move to safer parts of Winnipeg during the danger period.

And then, one day, the realization came that the fight had been won, even though it wasn’t over. It was as if a prize fighter, with one eye swollen shut, and his lips cut, and his hands bruised and broken, and legs heavy as lead, suddenly knew that, in spite of all the punishment he had taken, he could go out in the last round and finish the fight.

The river had been a complete victory over the small towns to the south but it was licked in its attempts to engulf all of Winnipeg. The damage was great but none of the things that made Manitoba a productive area had been permanently ruined.

During the work of consolidation that went on then, while the river receded downward, the dikes held and attention could be given to the wounds left by the fight. One by one, men and women could return to their homes and business premises to see the damage that had been done. Many of the structures would not be habitable again until midsummer or later; perhaps never. Some of the farms would have no crops this year, from some the barns and the livestock had disappeared.

There was a job for Canada, for individuals, for relief agencies, and for the government. A whole-hearted response followed the first appeals and help began to come from Britain and from the United States as well.

In this second phase, the planning for rehabilitation, Imperial Oil Ltd., a company that has given $90,000 to the Manitoba Flood Relief Fund, Employees in the divisions across Canada have joined with other Canadians to collect money and clothing for the flood victims. Some Manitoba employees have given several days’ pay to assist the Fund. They are among those who were close to the disaster—the men and women who worked day after day, seven days a week, helping to maintain the supplies of gasoline and oil during the emergency.

The next phase is the actual work of reconstruction. This is being tackled by Manitoba into the spirit of the recently formed slogan, "We Urge You and We—But we’ll Win!" which was displayed on Winnipeg’s City Hall at the height of the flood. Some of the damage never can be repaired, some promises are gone forever; some lives have been changed. But although few people in southern Manitoba will ever forget that dreadful first Friday night in May, heroes are being restored, firms will be re-stocked, new crops will be grown, flood宣传 materials will be pieced together, some of the roads will be lost for ever, some of the farm buildings will be lost for ever, but the Red River flood will be over.
Executive Changes at Annual Meeting

M. L. Haider Elects a Vice-President of Imperial Oil Ltd.

M. L. Haider, a director of Imperial Oil since 1948 and general manager of the crude oil producing department, was elected a vice-president of the Company. Mr. Haider has had wide experience in several major phases of the oil industry. After graduating from Stanford University in 1927 with a B.Sc. degree in chemistry, he became a research engineer specializing in natural gas. In 1938, after a varied experience in exploration and production, he became head of the production research and engineering department of the Standard Oil Development Co. In this position he was in charge of a group responsible for research into all aspects of oil exploration and development, endeavouring to improve oil field engineering methods. He remained in this position until 1945, when he joined the Standard Oil Co. (N.J.) producing department. The following year he came to Imperial as head of its producing department.

Trevor Mauro Elects a Director

Before joining Imperial, Mr. Mauro was a director and vice-president of McLeod, Young, Wair & Co., Ltd. He was born in England in 1895 and came to Canada in 1913. He attended University of Toronto Schools and the University of Toronto and joined McLeod, Young, Wair and Co. after graduation in 1928. He had experience in statistical, sales and sales promotion work and later became sales manager. In 1946 he was named a director and vice-president. In 1948 he was vice-president of the Investment Dealers Association of Canada. Mr. Mauro has a wide knowledge of finance and corporate financing.

A. E. Halverson Retires

A. E. Halverson, who has been a director of Imperial Oil since 1934, has retired after 37 years with the Company. Mr. Halverson joined Imperial as a salesman in 1913 at Edmonton. Five years later he was appointed assistant manager of the Alberta marketing division and in 1921 was transferred to Winnipeg as acting manager. The following year he became assistant general sales manager for western Canada and in 1939 was appointed general sales manager for the territory west of Port William. In 1934 he became general manager of marketing operations throughout Canada and was elected a director. In 1945 he relinquished his marketing duties and became contact director for a number of corporate departments at the Company's executive offices.

D. W. McGillivray Appointed Treasurer

D. W. McGillivray has been appointed treasurer of Imperial Oil to succeed the late K. A. Henderson who died suddenly last Dec. 31st. Born in Starnes, Mr. McGillivray was educated there and at the University of Toronto where he obtained a degree in political science and economics. He joined the Company in 1932 at Starnes refinery and later became budget controller. In 1940 he moved to the comptroller's office in Toronto to direct financial analysis and to handle special assignments. In the spring of 1948 he attended the advanced management course at Harvard Business School and soon afterwards became assistant to the treasurer.

John W. Hamilton Becomes General Counsel

John W. Hamilton has been appointed general counsel of Imperial Oil. Born in Picton, Ont., Mr. Hamilton is a graduate of the Royal Military College and Osgoode Hall. After a year in private practice he joined Imperial in 1939 as assistant solicitor. In 1939 he entered in the Royal Canadian Navy and held the rank of lieutenant-commander when he left the service. He returned to the Company in 1945 as solicitor, became assistant general counsel in 1947 and counsel and manager of the law department in 1948.

J. A. New Retires as General Counsel

J. A. New, general counsel for Imperial Oil, has retired after 30 years with the Company. Born in Southampton, England, Mr. New came to Canada at an early age. During World War I he served overseas as an officer in the Third Canadian Division. On his return to Canada after the war he resumed his law studies and after graduation from Osgoode Hall in 1921 joined Imperial as a solicitor. In 1923 he became assistant secretary and in 1944 was appointed general solicitor and general secretary. He was appointed general counsel of the Company in 1946.

FIELD REPORT

Imperial Extends Acreage

Western Canada's fast-sputtering oil exploration and development activities continue its growth with some 649 companies prospecting oil or searching for it from Manitoba to the Pacific coast and from the international border to the northern limits of Alberta.

Early this spring Imperial Oil announced that it would explore for oil in Saskatchewan and Manitoba. This is the Company's first attempt to extend its activities into these provinces, but it marks a resumption of the work carried out in Saskatchewan during the years 1939 to 1946.

The Company holds about five million acres of freehold rights in Saskatchewan. An exploration permit covers 600,000 acres of Crown reserves as well as freehold lands in Manitoba. This year's program will probably comprise gravimetry and magnetometer surveys. The work is being directed by A. M. Bedd from a district exploration office which has been set up in Regina.

Through subsidiary companies, Imperial has taken exploration permits on two million acres of Crown reserves in northwestern Alberta. The most northerly reservation is adjacent to the Alberta-Northwest Territories border.

Imperial is sharing with three other oil companies in a co-operative aerial survey of some 40,000 square miles of northern Alberta. An airplane, towing a magnetometer, will cover the area in a series of parallel strips. The survey by airborne magnetometer will speed up the search for oil in this region, where snows and mosquito clouds trail difficulties.

With continuing rapid development of Alberta's existing oil fields, potential daily production at the first of June reached about 135,000 barrels a
Petroleum in Philately

Canada's new postage stamp is another recognition of the contribution of Alberta oil to the nation's economy.

Canada's oil, you can now take it from the post office department, is here to stay. Oil, as of March 1st this year, entered the very select group of subjects deemed suitable, significant and permanent enough to be included in the picture gallery of Canadian stamps. And, make no mistake, to gain approval of the judging jury of this gallery, domestic petroleum production had to rank as a matter of great national importance.

For the next five years or so the regular issue of Canada's 50-cent stamp will be a scene, printed in light green, depicting oil derricks, storage tanks and a new well blowing in; Alberta's foothill country shows in the background and the prairie's wheat stubble in the foreground. How many hundreds of thousands or millions of copies of the stamp will be issued may already have been decided by the post office, but until all copies have been sold the print order for the issue will remain top secret.

The present policy of the Canadian post office is to draw attention to the country's basic industries by means of pictorials—that is, stamp issues which illustrate a phase of Canadian life. The western oil fields stamp is in this class. The industry had not previously been honored among the handful of topics displayed on our stamps and the committee in charge of new issues decided it was high time Canada's oil developments were publicized via at least part of the two-and-a-half billion pieces of mail handled by the post office in a year.

Technical advice about oil and suggestions for suitable art work were sought from oil companies and various government oil experts; a file of photographs was collected; and the problem was turned over to the Canadian Bank Note Company, a company under contract to the federal government to design and manufacture our postage stamps.

The picture was to be typical of the oil industry, and authentic. An artist on the Bank Note Company's staff—who remains anonymous, conforming to that company's policy—produced a design that went through many hands and many hours of conference before it was finally approved by the Postmaster General. Six months elapsed from the date of approval of the design to the day the stamp could be bought through the wickets of any of Canada's 12,000 post offices.

The oil stamp may, or may not, become a collector's item. Either result is of secondary concern to the post office. Canada's postal authorities are fully aware of the cultural and publicity value of stamp designs, but to them a stamp is primarily a means of collecting the money that will pay the expenses involved in moving a piece of mail from here to there. They have a very friendly feeling for all stamp collectors, no doubt partly due to the fact that when a philatelist buys a stamp to salt away in his album the transaction is pretty well all clear profit for the post office because the department does not have to deliver its usual service in exchange for the stamp's
purchase price. But the practice of issuing postage stamps of flashy designs or limited numbers primarily for sale to collectors has no friends in Ottawa.

Our postmen try to limit new designs to not more than three a year, including pictorial and commemor-ative issues. The commemoratives are just what the name implies, stamps bearing an illustration commemorating some event of national importance—for instance, the bicentennial of the founding of Halifax, or the 100th birthday of responsible government in Canada.

Commemorative stamps are issued for definite dates in predetermined quantities and when the supply has been sold no more copies are printed. Pictorials are printed in quantities and sold over a period roughly decided in advance. The regular issue stamps, those in the one to five cent denominations, usually change their appearance only when a new monarch comes to the throne, or when the post-office awards a new printing contract.

In all, Canada has issued more than 300 different stamps. The full list appears in the catalogue published by the commercial stamp dealers. Copies of all new issues are presented by the government to the Governor-General and to the King. The post-office itself, of course, has a complete set of all stamps that have been printed, including the famed 12-penny black, of which 1,700 copies were issued in 1850 and which now has a catalogue value of $3,500.

The sale of postage stamps in the fiscal year which ended last March 31st, brought the post office about $60 million in revenue, about two-thirds of the department's total income. Just how much money was invested in stamps by collectors is impossible to determine since a philatelist can buy his stamps at any post office wicket and only part of the collectors' purchases are made through the department's Philatelic Section. However, a conservative estimate is that $300,000 was paid the post office during the year for stamps that will never see the inside of a mail box.

The Philatelic Section, which was organized in 1922 and has a staff of 15, currently fills 1,000 mail orders a month. As a rule, the Section operates a counter for sales to collectors who come round in person. During the summer, tourists, particularly American visitors, become the section's business. The office does not advertise its services but, on request, it is happy to provide a list of its wares. Only unused stamps are sold, of course, and always at face value.

The Section's "Order Form for Mint Canadian Postage Stamps" lists a hundred items, including part of the Confederation commemorative issue that first came out in 1927.

Some Canadians regard postage stamps as an investment and purchase full sheets of new issues because they will never be worth less than their face value, and the face value may be saleable for a whole lot more. When a stamp is in short supply and is particularly sought after, the post office limits sales to one stamp at a time to any one customer.

It is this desire to be entirely fair to all collectors that sets the post office policy of not announcing, until all stamps have been sold, the print order of any particular stamp. If dealers knew in advance that a certain stamp would be available only in limited quantities, they would naturally invest heavily in the issue—which might be very good for their business but would be resented by other collectors who might have to pay a premium.

Of subjects for Canada's stamps is solely a matter for Ottawa's decision, but to a certain extent the appearance of our stamps is under international control. By regulation of the Universal Postal Union, a body of which Canada is a member, stamps in denominations required for international letter and post card rate are of the same color for all countries. Canada's four cent stamps, for instance, are nowadays always issued in red.

This uniformity in color has a domestic as well as an international advantage since it helps mail sorting by post office clerks, who work at a fast clip and identify the amount of postage paid on a letter or card partly by the standard colors used on the various one to five cent stamps. Colors for the seven cent to one dollar issues are not under U.P.U. control but are selected as the colors best suited to the stamp's illustration.

Our stamps can be printed only by a "security printer"—a printer whose staff has been investigated and approved—of which there are only two in the country. Currently the Canadian Bank Note Company has the printing contract.

A special kind of paper is used and the printer must account to the post office for every sheet received. Careful count is kept of the paper used in the finished stamps; the waste is calculated and the printer must destroy the unwanted paper. The post office, for its part, accounts for every sheet of stamps taken off a plate and destroys the plate once it has fulfilled its function.

It is, of course, a criminal offense to reproduce a Canadian postage stamp but postal authorities have little fear this will be attempted. The difficulty of duplicating the engraving is considered sufficient protection because any man with sufficient technical skill to counterfeit a postage stamp could make more money on other projects. There could be little cash return from counterfeit stamps, even of good reproductions intended for the philatelic trade, because the inevitable imperfections in the fine engraving would quickly show up under a collector's glass.

The critics, not the counterfeaters, are the bane of the post office. It seems that there will never be a new stamp that satisfies everybody and the oil fields pictorial was no exception.

When photographs of the stamp were released to the press in advance of sale, the critics pounced. The faults shown in the backgrounds, the critics claimed, identify the oil field as being in southern Alberta while the great new Canadian fields are farther north, up near Edmonton. To comment on this post office impatiently replied that the drawing illustrates no particular place but is intended to typify our western oil fields in a general way; the faults in the background and the wheat stubble

This is how our stamps get their edges—the perforations that separate them when they come in big sheets. The girl operator uses a mirror to watch both edges of the machine so the sheets of stamps will not pull up as they pass through.

Here paper is being fed into the rotary printing press. A special kind of paper is used and the printer has to account to the post office for each sheet required in printing the stamps. The inevitable imperfections in the fine engraving would quickly show up under a collector's glass.

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Oddities Make Stamps Valuable

Postal authorities can’t tell if the oil field stamp will ever be a collector’s item. Stamps become valuable for various and unpredictable reasons: sometimes because of an oddity in design; sometimes because of a lack of attention when the stamps are issued; sometimes because of other factors.

The “Weeping Princess”, a green, one-cent Princess Elizabeth stamp printed in 1935 became a collector’s prize because of an accident. When the stamps were being printed an engraver’s tool fell on the plate. As a result one stamp on each sheet of 400 bore a mark, like a teardrop, just below the Princess’ right eye.

The stamps were on sale before the mark was noticed but, to be fair, the post office called in all the specimens it could find and sold them first-come-first-serve, at face value. The present dealer’s price for a “Weeping Princess” is $10. The issue also is unusual because it shows the Princess as a girl, the only Canadian stamp bearing a child’s picture.

The most popular, but not the most valuable, Canadian stamp seems to have been the 1947 Alexander Graham Bell four-cent commorative. A run of 25,000,000 copies was sold in a very short time. The 50-cent “Bluenose” stamp of 1928, showing the famous fishing schooner, also was popular immediately but when the 50-cent “Grand Pré” stamp came out in 1930, for some reason collectors paid little attention. Where most stamp albums include the “Bluenose” — sometimes called the world’s most beautiful stamp — comparatively few copies of the Grand Pré were cached away. The result, today, is that an unused Grand Pré is catalogued at $10 while the Bluenose is worth only half that price.

At present collectors are interested in the 1949 issue of King George VI stamps because there are two sets. Both show the King in civilian clothes but for reasons of design the first issue did not carry the usual words “Postal” and “Postage.” Later it was decided the words must appear and the revised set was issued. Time alone will tell how this change has affected the value of the sets.

The Young “Old-Timer”

Not only changes never bothered me,” asserts G. J. “Jimmy” Fleet of Sarnia, puffing on his favorite pipe, “I took them in my stride.

Veteran of 50 years' service with Imperial Oil, Jim has witnessed many of the developments which have made the oil business one of Canada's fastest changing industries in the past half century. Now, at 65, he is making another fast change—the one that comes when a man retires.

Jim Fleet's 50 years with Imperial make him a real old-timer of a relatively young industry. Only two former Imperial Oil employees have equaled his service record: one is George H. Dickinson, who retired four years ago from the Quebec marketing division; the other was the late C. G. Stillman who was associated with the Company for half a century and was president of Imperial from 1919 to 1933. Jim Fleet's job was barrels—thousands of them. And he says that those barrels alone, even if you'd had nothing else to go by, would have given you a pretty good idea of the changes that were taking place in the oil business—and in Canada itself for that matter. When Jim started as a lad in the cooper shop, the barrels were made of wood, and they travelled on big wooden drays pulled by hunky-dory horses over planked roads. Mostly, they held kerosene.
Jim saw the wooden barrels give way to steel drums, the drays give ground before trucks that wheezed and snorted worse than the draft horses at first, but which gradually seemed to gain wind and run more and more smoothly as the years went by. He saw the plank roads give way to macadam, then to concrete and asphalt. He saw kerosene displaced in favor of gasoline, diesel and furnace oils and scores of specialized lubricants. And he saw his own job change from what it was to what it is, just as he himself progressed from cooper's helper to supervisor of barrel reconditioning.

Jim watched it all—his refinery grow from a small 1,500 barrel a day plant to the largest refinery in the British Empire with a capacity of 52,000 barrels a day. He was there when the first gallon of gasoline was made and he kept posted on each new product the refinery turned out.

With this background, it’s not surprising that Jim has a natural expressness for everything modern. If a new-fangled machine at the refinery could do a better job than the old one, he was all for it. He likes to be the first to do things: he bought one of the first radishes in Surina; he was one of the first employees to participate in the Company’s savings and stock purchasing plans.

Jim started to work at the refinery back in the summer of 1899. His next-door neighbor was “Bob” Wade, the foreman of the cooper shop and Bob suggested that Jim should take a job during the summer vacay. Bob was a good boy and a good friend,” Jim says. The summer job out worked so well that the next year Jim, who had completed his high school studies, went to work full time at the refinery.

It was a case of oil versus the railroads for Jim had thought of becoming a railway man. “In those days, railroading was good money,” too,” Jim recalls. But his mother was against the idea because of the broken hours and the time away from home. “Jim talked me out of it,” Jim reflects, “and I’m glad she did.”

Promotions at the refinery came steadily for Jim. At 18 he was teaching other young men the art of making wooden barrels. He estimates that he could turn a raw recruit into a first-grade cooper in a year.

"The only trouble was," Jim says ruefully, "we’d train a man and then the other departments would come along and take him from us . . ."

In the 1920's steel barrels began to replace the wooden barrels made in the cooper shop. For a while Imperial did not make its own steel barrels but purchased them. In this period Jim set out to learn everything he could about reconditioning the barrels that were already in use. By the time the cooper shop was dismantled in 1931, he was supervising the entire reconditioning operation—from the moment the iron-encased drums were brought in from the barrel field (or "back 50 acres") as it was called, through the various stages of washing, dunnage removing, painting and drying, until the big containers were fresh and clean again, ready to be refilled.

Large numbers of barrels are required to deliver products and they represent a big investment. Each barrel must be kept in condition to travel again and again to the fullest extent of its usefulness. Reconditioning is an essential operation at all times but it became particularly urgent during the war when the acute steel shortage drastically cut the production of new drums.

Jim directed the reconditioning as supervisor of barrel preparation and transportation until the end of January this year. When he retired he felt a little lost in spite of the wise send-off in his honor, the five-piece band, the friends from many departments who gathered to wish him well, the gold watch and the life pass to his refinery.

But he didn’t waste long over regrets. He took a part-time job at the Surina curling club and soon found he needn’t lose touch with his former work. He meets his friends from the refinery after hours; they talk about what is going on at the plant, always winding up with "Do you remember when . . .?"

Sometimes he feels they are not as tough as they used to be. Take the job of washing barrels. Jim recalls when this was particularly money work and involved cleaning the barrels by hand and sloshing around in a solution of caustic soda. Now there is a machine called a "barrel tumbler" to do the job. Then Jim continues, "Why, I used to bicycle to work before six in the morning and often wouldn’t return home until after 10," Jim explains earnestly. "I was never the worse for it either."

But when he talks like this Jim recognizes he is speaking as an old-timer and that the conditions of half a century ago when he started work would not suit today.

The year 1919 stands out in Jim’s mind. In that year came the eight-hour day, the introduction of a pension scheme designed to give employees security in their old age, and also the joint council system of employee-management representation.

There was a social evening at the refinery to mark the occasion and Imperial’s, president, W. J. Hanson, whom Jim describes as "a great old friend," outlined the new Company developments to the men.

Over the years other changes were introduced that affected Jim personally: the 40-hour week, vacations with pay; the protection provided by group life insurance; death benefits; sickness and accident benefits and hospitalization and surgical benefits.

Jim was away from work on only three occasions—when he was married and took four days’ leave of absence on his honeymoon at Niagara Falls in 1935; an accident 41 years ago kept him away four days; and in 1938 a bed case of flu laid him up for five days.

With this record it is obvious that Jim enjoys work but he is also a devoted family man and an ardent sportsman. His wife is the former Ada Edith London and they have two sons and three daughters, all of them married. There are 13 grandchildren.

One son, Orvin Junior, is an internal mailman at Surina refinery and the other, Harold, is a machinist at Polymer Corporation.

Jim can’t quite make up his mind which is his favorite sport—fishing or ice skating. It all depends on the time of year. On a winter Saturday night, if he isn’t listen to Foster Hewitt on the radio he’s watching a game at the new Surina arena. And on nights when no games are being played, he probably can be found at the rink skating with one or more of his grandchildren.

In the spring and summer he’s just as enthusiastic about fishing and this year many good fishing trips are in prospect in the new Mercury he bought just after he retired.

In short, Jim Fleet is a man who has worked hard for 50 years in the oil business and now is enjoying both his pension and his leisure. Retirement is a change which he is "taking in stride.""
Canada’s
First Degrees
in Oil

The University of Alberta has graduated its first group of petroleum engineers. In the past young Canadians had to go to the U.S. or abroad for the course.

This summer a group of young men, each with a specialized graduate’s “sheepskin” from the University of Alberta, has scattered to take their places in the new oil fields of the Canadian west.

The young men—there are 16 in the group—all wear new and clean field jackets, the badge of the greenhorn in any oil field, but they are “greenhorns with a difference” because their sheeplins represent the first degrees in petroleum engineering ever granted by a Canadian university.

Canada has trained many highly competent graduates in the other phases of engineering—chemical, mechanical, mining, electrical and civil—but until recently young Canadians who have wanted to specialize as petroleum engineers have had to go to universities in the United States or abroad. Many of those who did go remained away and Canada lost them.

Now a full course in the subject can be taken in Edmonton, in the heart of Canada’s great new oil development.

The new course is an indication of the rapid growth in the importance of Canada’s oil. It recognizes that, with Alberta established as one of the most active oil areas in the world, special training must be provided through the Canadian educational system for young men who will be needed for responsible jobs in the new fields.

With this objective the course has been organized and is directed by Dr. George W. Govier, assisted by his professors, W. Gregg, Dr. Donald Qureshi, A. L. Scott and Dr. D. B. Robinson. They also direct special petroleum research at the University and help to arrange short term courses for veteran oil men.

In the simplest terms, the petroleum production engineer’s job begins when a decision has been made to drill a well and continues until the oil or gas production, if any, is on its way through a pipe line or some other transportation medium. His specialized knowledge is required for the drilling of wells and efficient production of crude. He must be equipped to think in terms of an entity field or reservoir and not just the well he happens to be working on. He is concerned with proper well spacing, conservation, best and most economical oil and gas recovery methods.

The work of the petroleum engineer requires a broad and fundamental knowledge of oil and this is what the course has been designed to provide. Because of the current interest in oil it may be considered a “glamour course,” but it also is a “tough one,” calling for as much or more grading work as any other form of engineering education.

As they leave the University, the new graduates still consider themselves “greenhorns in oil,” to spit of four years of intensive study and at least one summer spent as roughnecks and roughnecks in the oil fields, they will need a considerable period of “internship” on the job—just like young doctors—to become fully-qualified practitioners.

This is by design because the course is not intended to graduate a “sort of advanced technical school” engineer whose knowledge consists only of familiarity with special tools and equipment. It has been found that fundamental education produces an engineer who may be a “slow starter” in the field because he has to familiarize himself with the particular brand or make of equipment in use, but he is the long-range “best bet” because of his sound foundation in oil and gas field development.

The need for a Canadian course in petroleum engineering first began to be considered in the 1940’s while the Turner Valley oil field was developing. The project did not take form for many years, although a university committee working in 1941 and 1942 recommended inclusion of petroleum subjects at the University of Alberta. Later, the Association of Professional Engineers of Alberta made strong representations to the Alberta government to have a course organized.

“Importia’s discovery at Leduc in 1947 really touched off the development of the new course,” Dr. Govier says.

A second university committee, headed by Dean R. M. Hardy of the Engineering Faculty, had been studying the curricula of American universities offering the course. Oil officials were asked to define the industry’s requirements.

At that time Govier was studying for his doctorate in chemical engineering at the University of Michigan and was concentrating on special petroleum problems. He had accepted membership on the Alberta Petroleum and Natural Gas Conservation Board and he was asked to organize the new subject at the University.

Without specialized petroleum equipment or adequate accommodations, Dr. Govier opened the newly combined department of chemical and petroleum engineering at the University in the 1948 fall term. Sixteen pre-chemical and mining engineering students who were beginning their third year studies took the petroleum course option.

The 16 pioneer students continued their basic engineering studies in the 1948-49 term and no actual petroleum courses were taught that year. At the beginning of the 1949-50 term sufficient equipment had been collected or built; Professor Gregg had returned from Berkeley, Calif., to be key man in the department as assistant professor of petroleum engineering and the course became specialized. After a “tough, rough year” of concentrated work, the 16 pioneers were ready to graduate.

Students taking the new petroleum engineering course study models of oil equipment in this University of Alberta classroom.
It was a fast job of organization. “In the next couple of years we hope to find the best arrangement of courses,” says Dr. Grier. “But we are convinced we have started with the correct philosophy.”

The course has three objectives. It provides training in the basic sciences which will give a firm foundation in physics, chemistry, geology and mathematics. At the same time the students acquire a fundamental knowledge of the materials, machines, structures and processes associated with petroleum engineering activities.

The third objective is to provide training in engineering method. In their fourth year the students take two specialized petroleum engineering courses. One of these deals with the fundamentals underlying engineering practice employed in exploration, drilling, production and transportation. The other is a study of the physical principles underlying petroleum reservoir engineering.

Petroleum research is a major part of the new undertaking. Some objectives of this research are hard to explain to non-scientists, and no attempt will be made here to provide a detailed explanation. But several projects have been started that may have important results.

One of these, which is being launched by Dr. Donald Quon, Alberta-born research engineer, is research on the utilization of natural gas in the western fields. There is the work of Gerry Martin, studying for his master’s degree on an Imperial Oil graduate research fellowship. He is constructing equipment for “flow analysis of petroleum reservoirs by electrical analogy.”

Fancier-titled research, also of top importance and complexity, is being carried out by John Fisher, another candidate for a master’s degree who is doing research on the “flow of non-Newtonian fluids, of which drilling mud is one.” “Gas lift” research is being conducted by Jim Dunn, and research on the “utilization of Alberta asphaltite” is being undertaken by Vancouver-born Jack Eng.

The oil industry will benefit from the work of the new graduates and from the research at the University. In addition, veteran oil men are being assisted through the program of short-term courses conducted jointly by the University’s new department and the department of extension.

Last year the first two mid-school sessions for the study of the fluids that are important in drilling were held and this year the program has been expanded. The mud school was repeated and an emulsion school and later a gas flow measurement course were added. Experienced oil men come in from the fields to study these subjects.

Understandably, the Canadian oil industry is solidly behind the new developments at the University. In fact, the University has been offered more financial assistance for the new course than it is prepared to accept at this point.

“We are looking forward to considerable support from the industry,” says Dr. Grier, “but we feel that before approaching industry for help the Alberta government should provide the essential and basic equipment. Then industry may help with the provision of special and research equipment for graduate studies.”

Imperial Oil was one of the first concerns to offer aid and the first to be taken up on its offer. The company supplied two laboratory units which are being used for special instruction and in Dr. Quon’s research.

Dr. G. W. Grier is the director of the petroleum course. J. W. Gregg is assistant professor, petroleum engineering.

The new department is constructing an extra-ordinary amount of its own equipment. For instance, it is building a “miniature” fractionating column extending two and a half stories through the west wing of the University’s Medical Building where the department of chemical and petroleum engineering is housed for the time being. It also has produced its own gas flow unit as well as several other vital pieces of equipment.

Right now the biggest problem of the new course is to obtain adequate quarters for instruction and research. The construction of an engineering building is being considered but the plans will have to wait their turn because the University of Alberta, like other Canadian universities, has faced the problem of a large post-war expansion in almost all departments. At present the cluttered campus is in the throes of a $9 million building program, financed by money from the provincial treasury but the bulk of this construction is for new hospital and medical facilities, a memorial library, and a students’ union building.

Next term’s petroleum engineering students may move into a wooden military hut. Up to the present they have been crowded in with 92 chemical engineering students in their fourth year. The space problem for the chemical engineers will ease next term because the largest post-war university class has graduated this spring. But for the petroleum engineers the problem will become worse as the course becomes more popular.

And become more popular it will. It is expected that there will be 25 final-year students on hand next term, and that an increasing number of the first and second year students in other engineering branches will choose to graduate as petroleum engineers because of the oil developments in the Canadian west.

About the graduates Dr. Grier’s comment is: “We set out to teach them how to think and how to apply the engineering method and believe we have succeeded. We are confident that industry always will stand behind us and behind our students in this new Canadian endeavor.”

Establishment of this new course in petroleum engineering is still another indication of the increasing importance part which the new oil developments are playing in the national life. The developments are providing stimulation not only to business and industry, but now to education as well. All are helping to build a stronger Canada.
City Life on the Farm

Oil and electricity team up to bring modern living and working conditions to Canadian agriculture

W. R. Judge, who has a farm in central Ontario a few miles northwest of Toronto, pointed to a row of new fence posts, yellow and glistening. "That's a job of work," he said, "that I'd have been pressed to do in a week, even with fair weather and damp ground easy to work. I couldn't have done it at all last summer, the ground was so hard and dry.

"Probably have broken my back and my tools, both," he grinned. "If I'd tried to dig those holes by hand. So I didn't try. I hired a man with a tractor that has a post-hole digging rig and he dug those sixty holes faster than sixty ground hogs. Billed me for exactly half a day's labour.

"You know," he continued, "that ground was so hard the mechanical digger broke half way through the job. It used to be that a breakdown in equipment almost always meant a long delay but this time we phoned by long distance to the factory in the States that make the mechanical digger and we had the replacement part the next day. They sent it up by air express."

"That's just one small but significant incident illustrating that the old saying "nothing ever changes down on the farm" is outdated and incorrect in Canada in 1860. The record shows that agriculture, the country's most important single industry which employs one out of every three male wage earners, is also one of the country's most advanced industries. The farmers of Canada, individually and collectively, are a modernized big business.

While no one farmer is typical of Canada's rural population and no one farm or farming district truly exemplifies the country's agricultural problems and progress, the story of W. R. Judge is interesting at least a partial summation of modern history on Canadian farms.

Born on a farm that was then an arduous day's travel by horse and rig from Toronto but that is now only a comfortable hour away from the city by car on an all-year, all-weather highway, Mr. Judge has witnessed a lot of growth—including that of his two daughters and those sons. In the days when he first farmed on his own, says Mr. Judge, from a helping son couldn't have hope to handle more than a hundred acres. Today, with a reasonably full complement of the power equipment that is available, the same two men can competently work 250 or 300 acres. Some men, he states, under certain circumstances, might handle as much as 400 acres.

Milling by hand was once a chore that turned acres people away from dairy farming than any other work. Today thanks to the mechanical mills, dairy farmers have been able to increase production and also to decrease hours of labor.

The rasp-sheathener or combine is a familiar sight in western Canada where large wheat farms often cover more than a section.

A well-informed, up-to-date farmer, Mr. Judge subscribes to a metropolitan daily newspaper and several general magazines and other periodicals. On international affairs, domestic politics and matters which may affect long-range marketing of his products he seems better informed than most of his city counterparts—who would be owners of small businesses or, perhaps, plant superintendents in some manufacturing industry.

In his lifetime he has watched with interest, and often taken part in, many basic changes in his industry. More than 25 years ago he was the first farmer in his district to install a stationary gasoline engine to provide the power to grind his grain for pig feed, to turn his fanning mill and ease other time-consuming chores.

Electricity and petroleum are partners on many Canadian farms providing power for the farmer and his wife. Like a household in the city, Mrs. G. W. Neilson works with a washing machine while a radio supplies her entertainment.

Too experienced a businessman to grasp every new development in farm machinery before it has had its testing time in actual operation, Mr. Judge is nevertheless of the opinion that a farmer really doesn't have any choice in the matter of whether or not he will utilize power. He firmly believes that a farmer must have power equipment to do an efficient job.

"It is the only way he can succeed at his business," he says, "or even stay in business."

He uses both a tractor and a truck on his property and uses either gasoline or electricity for every job around his barns. He doesn't own a combine but has hired them in the past to harvest his wheat. Next season he plans to buy a threshing outfit. He owns a dozen cows and, though that doesn't put him in the ranks of the dairy farmers, he still finds it

Farming has become more efficient since the introduction of mechanical aid. Norman Judge of Mount Royal, Ontario, can work at least twice as much land in one day with his tractor-cultivator as he did with horse-drawn equipment.
desirable to have an electric milking machine and an electric cream separator. He is no longer faced with the problem of delivering his cream to a creamery. The company he sells to picks the cream up at his gate.

Mrs. Judge's eldest daughter, Mrs. A. G. Neelands, lives on a farm that borders her father's place. Mother of two robust young boys, she is a farmer's wife by very definite choice. When she finished high school she moved to the city, took a business course and was employed as private secretary to the head of a large manufacturing company. She had ample opportunity to compare the attractions of city and country life; she chose the country. Now she looks forward to a visit to the city in about the same way an urban housewife looks forward to a drive in the country; it's a pleasant change, and that's about all.

Mrs. Neelands' household equipment is the same as you would expect to find in a well-equipped city home. She enjoys the advantages of electric lighting, electric refrigerator and an electric washing machine as well as an electric sewing machine. Her baking—at which she is proficient and a big producer—is eased by an electric mixer. The house is heated by an efficient coal furnace. She doesn't have a deep freezer in the house but does have a deep freezer locker in a nearby town. A grocer's truck drives to her door twice a week carrying the full variety of goods that crowd the city grocer's shelves. One of her sons is in public school age and has about a mile to walk to school but when he enters high school a bus will pick him up at his door and take him to the large, modern school only a few miles away.

Mrs. Neelands, perhaps unlike many farm wives of today and certainly unlike all farm wives of a previous generation, has no field or barn chores as her daily lot. Her husband, a young and progressive farmer who is an ardent and early supporter of anything and everything to do with power farming, runs a 160-acre farm and rents an adjoining 100 acres of grazing land. His well bred Jersey herd is the subject of an accounting system that would interest a chartered accountant. Feeding records and production records are carefully kept on every cow.

On a dairy farm the big cash crop is milk and the big job is the year-round morning and night milking. Although the Neelands' milking is done by machine the product must still be cooled, canned and at the roadside for the truck pickup at seven o'clock in the morning, winter and summer, every day of the week. Still no easy job, it is a far cry from the not-so-gone day when the dairy farmer had to milk by hand, tend to all the other details and then haul his milk to the nearest railway station for an early morning trip to town.

Mr. Neelands runs his farm without a hired man yet still finds time to serve on the local milk producers' board, to attend church regularly, to belong to a young married couples' club and to interest himself in many other matters which farmers just didn't have time for only a few years ago. An enthusiastic breeder of greyhounds and fox hounds, with which he hunts the foxes and jack rabbits of his district, he also finds time in the fall to travel north to hunt deer.

To repeat: there is no truly typical farm family to be found. Living conditions and working conditions vary from farm to farm and from district to district across the country. But the Judge and Neelands families do typify Canadian farm families in at least two respects: they illustrate the almost universally improved standard of living in the farm home and the increased productivity per man on the land.

The rate of change in Canadian farm life has probably never been so rapid as in the 10 years since the outbreak of World War II. While the number of people engaged in the agricultural industry has gone down in the past 20 years, the farmers' cash income has varied from $297,000,000 in 1929 to $772,500,000 in 1949 to an estimated $2,474,499,000 in 1949. To-day the individual farmer's cash income averages about $3,000 a year. The increased use of farm machinery is on a similar scale. In 1939 the farmers of Canada bought $16,680,000 worth of implements and machinery; in 1948 they bought $146,956,254 worth.

Of the 700,000 occupied farms in operation in the country at the beginning of 1949, 383,745 were equipped with tractors, 68,199 with combines and 96,598 with thresher. While in many sections of the country a good team of horses must still supplement a farmer's power equipment, by 1948 the horse population of Canada had fallen to 1,900,000, the lowest point since 1906 and an average of less than three Dobbins per farm. But as horses have declined in number, mechanical horsepower has climbed steadily. Eighty-three per cent of all Canadian farmers own some sort of automotive equipment; 60 per cent own motor cars and 30 per cent own trucks. In addition, one out of every three farms has a stationary gasoline or electric motor.

Farming has become a more exact science—in Canada as throughout the world—through mechanization. The farm tractor, once a heavy, slow-moving machine, has become smaller, speedier and more efficient. As tractors have changed, the farmer's power tools have changed and today they are being designed for specific soils, climates and types of agriculture. To complete the circle, as mechanization has lightened the farmer's physical load and increased his efficiency as a producer, he has been enabled to spend the money for more and more complete mechanization.

The expending use of tractor power is changing the farmer's planting program. Fields that once were used to grow food to produce power can now be planted in cattle feed, marketable food products or...
other crops. The whole process of tilling the land has become scientific. Where once the farmer’s routine was “plough, plant and harvest,” he now takes into consideration the structure of his soil, its moisture content, control of weeds and insects and conservation of his topsoil.

These and other factors have produced many changes in working the soil and harvesting the crops. The plough, for instance, is one of the historical fundamental farm implements. But in working semi-arid grain lands farmers have found that they can replace the plough in favour of disc machines, blade-type implements and field cultivators. In parts of the country subject to heavy rainfall, power equipment is being used in contour farming and strip farming, combined with scientific crop rotation and grassing, to prevent wind and water erosion and to keep the land in permanent production.

Nor is the farmer today as much of a slave to the weather as he once was. For one thing he is much better forewarned than ever before of approaching weather changes. For another he is now able to take speedier action when warning comes. With his tractor equipped with lights, for example, he can, when necessary, work his land around the clock.

Research men, agricultural and industrial scientists, have developed many chemical products in the past few years to aid the farmer. And implement manufacturers have not been slow in devising machinery to make the best use of such discoveries. The increased use of chemicals is unexampled in Canada. In 1959 Canadian farmers used 233,000 tons of chemical fertilizers; in 1959 they used 334,000 tons; in 1948 more than 672,000 tons. New insecticides and herbicides, such as the now well known 2,4-D, are applied through new dusting and spraying methods, even helicopters being brought into use.

Hay making and grain harvesting have been revolutionized. Such equipment as the power mower, side delivery rake, forage crop harvester and pickup-baler and the newly-developed process of baling curing of hay have lightened the haymaking and improved quality. To handle the wheat crop, combine harvesters, developed originally for large-scale farming, have been adapted for mixed farming areas. Where a wheat harvest on even a small farm once meant back-breaking labor for many men, now it is almost a one-man job. The brushel of wheat that the Canadian farmer of a hundred years ago produced by 60 hours of field work is now being produced with less than two hours of field work.

With 175,000,000 acres of land in the farms of this country, the lot of the farmer—and, inevitably, of every Canadian—would be vastly different if progress had passed by the farm. In 1820, one farmer produced enough food for about four people; today he produces enough for 16. Much of this increased productivity can be attributed to the increased use of mechanical equipment which has increased average horsepower per farm from one and one-half to 36 during this period.

Power has brought greater productivity and higher living standards to the farm, and progress to all Canadians. The prosperity which the farmer has achieved through tilling his production is reflected throughout Canadian life, not just in the rural districts, but in the big industrial cities where industry is providing the tools and the energy for still greater agricultural advances.

Another example of efficient farming methods is this corn picking machine. Travelling at about 5½ miles an hour this two-row self-propelled machine will pick 2½ acres an hour. It would take a man about three days to hand pick an acre.
The Great North Road

Over the war-built Alaska Highway an ever-increasing number of motorists are travelling deep into Canada's newest frontier area—the still untamed northwest

It is only by an accident of war that the long, lonely ribbon of gravel which is the Alaska Highway happens to thread its twisting course through some of the wildest and loveliest country in the world. Built purely as a military road, with no thought of scenic value, by 14,000 sweating soldiers and civilians at the cost of $130 millions, it is now taking its place as one of the great tourist highways of the continent.

Thus, the ill wind of World War II has blown some good; it has given us 1,525 miles of a first-class highway that burdies five mountain ranges, 129 rivers, and 8,000 mountain streams to bring the breath of civilization to the jackpine forests and muskeg swamps of the last frontier.

This is the third year the highway has been dotted with the assorted vehicles in which tourists from Mexico, Hawaii, the Philippines, the 48 States and the 10 Provinces have chosen to drive to Alaska.

In 1946, before the big road was officially opened to civilians, the Mounties in Edmonton ran into a black bearded Baptist preacher from Texas who proposed to navigate the entire road in a motor scooter which bad a special compartment for his black spaniel and seven puppies. They turned him away. But today you can see every conceivable type
of conveyance travelling the dusty route to the North: two-ton trucks with horses built atop them, jeeps with pledgeless tops, old delivery wagons, converted school buses, custom-built Cadillacs, model-T Fords, 35-foot four roomed trailers — and even bicycles.

Some tourists pull out of Dawson Creek, B.C. (where the highway begins) in big station wagons with half a dozen extra fuel tanks, five or six spare tires, and have been known to carry 900 pounds of spare parts. Others while their motorcycles to emerge dust-beaten but happy at the turn of the highway where the boom town of Fairbanks lies nestled in Alaska's smoky hills. As Jim Smith, who runs a Whitehorse tourist camp has remarked. "One of everybody has travelled the Alaska Highway!"

It takes a minimum outlay of $360 apiece and a good 24 days for a party of three to make the trip to Fairbanks from eastern Canada and back again. Most tourists figure the money well spent and the time well taken because the highway provides a shifting montage of Fitzpatrick-style sunsets, Hippy-yeo geography and Frank Buck-cum-Halliburton adventure that is unequalled by any other stretch of gravel road in the land.

There is, for example, Yerrick Creek at Mile 1340 in Alaska. Instead of flowing along a valley bottom it runs on running along the ridge of a hill, 70 feet above the surrounding countryside. Engineers fear that someday it will slip, spill over into the valley, wash out the highway and leave a bridge on top of a hill, helplessly spanning nothing.

The White River in the Yukon, a great stream of volcanic ash, white as a battle-tale gray shirt.

There are the quaint little English brooks of the Rancheria Valley with suddenly issuing in the springtime, tearing out 200 yard strips of highway to a depth of 12 feet and ripping up bridges, piling and all. (The Little Rancheria once row 12 feet in 16 minutes flat.)

And there are the mountains — mountains with grooved and wrinkled flanks, mountains shaped like pyramids, mountains strewn like boulders, before shelter through broad valleys which have been chewed and scared by the glaciers of another age.

There are the Rockies and Cassiar and the Coast Range and the great purple slabs of the St. Elias mountains — highest on the continent — tumbling out of the clouds into the green waters of Kluane Lake.

All along the road there is color: lupins and blue-bells along the way in June; fireweed in July; lakes like Muno, high in the Rockies and greener than a mint's eyes or like Toolin in the Yukon whose skidded fingers are a deep shudder cornflower blue. There is the road itself, a ragged flat scar notching the green hills and, in sombre contrast, the burned areas where gaunt skeletons of trees, corpse white, stand like ghosts in a haunted forest.

There are other attractions peculiar to a frontier road: the cabin near Snag built in memory of an army engineer, killed while the great highway was a-building; the honeymoon cabin near Dry Creek with the words "Our First Home" carved into the log wall; the windowless tarpaper shack and black Quoest hut, crushed by the winter's snows, which the men who built the road once called "home"; the old wagon near Champlin which the Mounties once used to patrol the forest trails in the days when there was no highway.

The names of the 18 maintenance camps (one foreman, five men) stretch along the highway at 70 mile intervals are rich in the flavor of the north: Blueberry, Troutch, Sikanni Chief, Swift River, Stony Creek. And the men and women who run the roadside ales along the way are northerners, too, some old, like Old Bert at Burwash landing, and some new, like Bob Jordan at the Border Trading Post just over the Alaska line.

Old Bert, "the oldest bartender in the Yukon" mustered into Kluane Lake at the turn of the century, carrying his grubstake on his back. Bob Jordan, a blonde, mustached Navy veteran came up the highway by truck in 1947. He decided to go to forty Alaska because, after four years in the South Pacific, he'd had enough best to last him the rest of his days.

It is hard to remember, nonetheless, that the road is still a military highway, maintained by 725 army men, including a brigadier, and by 250 yellow pieces of road equipment — trucks, and graders, and scrapers, and graders — strewn out along the right of way. In the ordnance stores at Whitehorse there are 40,000 spare parts to keep them going.

All this helps to explain why the highway is still in top condition, why the grades and curves are maintained summer and winter, why every curve, bump, frost heave and snow drift is marked by a warning sign, why every washed out bridge is replaced promptly. (Engineers once hanged in a new 100 foot class 70 bridge at Little Rancheria in just three and a half days)

Though the speed limit is officially 45 mph, on the highway many a car luffs 50 or 60, especially in the winter when snow is packed hard as asphalt. Three Harvard students once made it from New York to Anchorage, Alaska in a record nine and a half days, but most tourists prefer a more leisurely pace — perhaps 300 miles a day, perhaps less. These travelers find plenty of good accommodation, meals, gasoline and automobile service at intervals along the road.

Imperial Oil played a major part in the building of the highway. (The Company supplied large quantities of a variety of petroleum products during the construction period.) Now nine Imperial retail outlets are in operation — an average of one every 50 miles between Mile Zero at Dawson Creek and Coal River at Mile 552 near the Yukon border. Eventually, Imperial plans to market gasoline and lubricants right to the Alaska border so that "the Esso oval" will be seen over the entire length and breadth of Canada.

Besides service stations (the greatest distance between them on the north end of the highway is 170 miles) there are four depots for major repairs between Dawson Creek and Whitehorse. Only minor repairs can be handled beyond Whitehorse.

Food along the highway is rough and ready, for the most part, but it's plentiful. Eating places vary from the renovated taxidermy construction shacks which are the highway's trademarks, "Joe's Place" is the shadow of the Pasco Bridge, for example) to the big lodges of parked snow for big game hunters. At "Joe's" Perrot on Canyon Creek, one of the best eating places, you can get homemade tomato soup, salad, fried chicken, new potatoes, two vegetables, grape jelly, hot biscuits, creamed potatoes and cole for $2.25. Mrs. Perrot cooked the construction gangs in the early days of the big road. Soon, she hopes to open a base parking.

There are hotels at Dawson Creek, Fort St. John, Fort Nelson, Whitehorse and Fairbanks. In addition, the British Yukon Navigation Company, which runs boats on the Canadian end of the highway, operates its own hotels at intervals along the route. Those are old army "U" bunks and can't be considered luxurious, though they're adequate.

The best stopping places are the big lodges at Marsh, Watson, Watson and Kluane (next, Mike Nolan's Marsh Lake lodge is typical of them all). Mike is a former Mountie who does $30,000 worth of big game business annually. Tysons from California and New York often find their planes at his front door. His 36-foot cabin cruiser will take you on a two week trip through a 300-mile lake and river system. From near the lodge you can shoot grizzly, Whitehorse, the famous Yukon community nowadays now is a tourist center. According to a Whitehorse tourist map preparation, "One of everybody has travelled the Highway."
of bad and good road. The first 200 miles, for example, is a 36-foot-wide, three-lane, Class A road. Then the highway begins the series of agonizing twists and turns which alternate with the straight wide stretches all the way to Fairbanks. These are sections of the old tote road hurriedly gravelled over and widened on orders from the U.S. Army when the highway appropriation was cut after the drops ceased to be a threat in the Aleutians.

Canadian army engineers are gradually straightening out some of the worst sections and replacing wooden trestles with permanent steel bridges. (On the wild Donjek River, where channels are constantly shifting and changing, a single big bridge soon will replace seven short spans).

And yet these very twists and convolutions are part of the Alaska Highway's charm, for they have something of the changing, unpredictable quality of the vast, lone land about them. The road starts out amid the pleasant chocolate and green checkerboard farmland along the Peace River. Suddenly the land changes as the road skirts the lip of the dizzy Munswag valley. It changes again as you cut through the living rock of McDonald valley in the land of hot springs and waterfalls.

It suddenly climbs 3000 feet into the clouds, knives through the mountains and begins its slow descent past the lily-fecked lakes and the aspen forests of the Liard country down to Whitehorse on the blue Yukon. North again, it winds through the Shakwa valley, past slender Klune Lake and its high, saw-tooth peaks and on to the shaggy rug floor of the Donjek.

Off the mountains march to the west, but the road goes on into new country, into the blue rolling hills of Alaska, out of the wild and into civilization until it reaches the tough, gaudy little town of Fairbanks, where jet planes zoom off the hard, concrete floor of Ladd field and wide-open gambling goes on 24 hours a day. And here the big highway ends. The Arctic Circle is just over the rim of the horizon, and over the next rim, where there are no highways, the frontier is free and untraveled.

(Travelers wishing to obtain further information about the Alaska Highway may obtain it by writing to any one of these sources: Editorial and Information Division, Department of Mines and Resources, Ottawa; Imperial Oil Touring Service, 56 Church Street, Toronto 1, Ont.; Officer Commanding, Royal Canadian Engineers, Alaska Highway Headquarters, Whitehorse, Y.T.; Chamber of Commerce, Whitehorse, Y.T.; or the Chamber of Commerce, Edmonton, Alta.)

Mountain rivers and streams that provide endless sport for fishermen can be reached by the Alaska Highway. The scope on the right-hand page is typical. One party pulled 70 pounds of Arctic trout out of Marsh Lake in only three-quarters of an hour's fishing.
Petroleum helps to speed delivery of goods across the land by providing asphalt for highways and gasoline for big transport.